

CLIMATE ACTION PLAN

2023

by the *RISER* Committee

Resilience
Innovation
Sustainability
Economics
Renewables



HOYLE
TANNER

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1. Introduction

1.1 Climate Change & Its Impacts

Significant changes have been observed in global climate over the last several decades. Climate change is a large-scale problem, and its effects are manifested in various ways that directly impact our day-to-day lives. These include sea level rise, extreme weather events, loss of ecosystems, food insecurity, and population displacement, among other related consequences. Historical carbon emissions have been a significant contributor to climate change, and projections from climate experts generally predict the continuation or future acceleration of carbon emissions and associated adverse impacts to the environment and human population.

A global concern with climate change is the rapid consumption of non-renewable natural resources. Continued dependence on these materials will ensure that natural minerals and oil deposits will eventually be depleted. Dedicated efforts are likely required to substantially divest of non-renewable resources in the near future and avoid the risk of facing their irreversible depletion without viable, sustainable alternatives.

Climate change impacts also have significant economic ramifications. Sea level rise and extreme weather events are causing damage to our infrastructure and are likely to become even more harmful, resulting in substantial costs to communities. Climate change is on pace to render thousands of coastal properties uninhabitable in the future and the resulting population displacement will put much of the burden of cost on individuals. The National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information noted in their [2022 Billion-Dollar Weather and Climate Disasters report](#) that between 2017 and 2021, climate-related natural disasters were responsible for an estimated \$788.4 Billion (USD) in losses in the United States alone. Associated damage to ecological systems could reduce or eliminate the services they provide, further compromising both natural ecosystems and our existing infrastructure's resiliency. For example, sea level rise destroying salt marshes leaves coastal communities more vulnerable to flooding and damages fish, bird, and invertebrate habitats. Ecosystem interruptions also spiral to other human industries such as fishing and agriculture.

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While there has been some recent progress toward international climate change mitigation efforts, identifying practical and effective strategies is a significant challenge. Many theorized solutions would be prohibitively expensive and complicated to develop and implement on a large scale. Given the associated difficulties with large-scale solutions, individuals and smaller organizations must contribute to help reduce global emissions and slow climate change. Hoyle Tanner is one of these organizations, and it is our responsibility to minimize our impacts to the maximum extent practicable. We aim to identify a deliberate approach to mitigate climate change and strengthen the resiliency of both our own company and the communities we serve.

Much of our evolution will involve improving our own internal business practices, but we can also influence change on a larger scale. As engineers, we have the opportunity to promote innovative, resilient, and sustainable solutions to our clients for both new and existing development and infrastructure. These adaptations are of paramount importance to Hoyle Tanner, and we have developed this Climate Action Plan to acknowledge our concern about climate change and highlight our responsibility to contribute to mitigation efforts. Our primary goal is to positively influence our employees, clients, communities, and industry to adopt better solutions in the future.

1.2 Large-Scale Solutions

Identifying and developing innovative solutions to mitigate future climate change is challenging as we continue to assess the potential threats and impacts. It is essential to continue building our knowledge base and understanding of actions and effects to pinpoint more specific objectives. After identifying our objectives, we can properly create and apply innovative solutions. Cost is an additional barrier to innovation. The cost of change can be a significant risk for new or untested solutions, especially if the cost-benefit analysis is unknown. These factors can influence an organization's ambivalence toward climate change, with non-sustainable practices maintained simply because they are the easiest or cheapest options. This way of thinking becomes a barrier to innovation and minimizes the opportunity for creative solutions to push their way into the workplace.

Willingness to change is necessary for organizations to overcome this mindset. Embracing the need to educate employees on climate change and its associated risks is a critical first step in this evolution, and there are many resources available to help facilitate organizational climate change education. Conferences, workshops, and independent research can all be used to help organizations and individuals educate themselves. Certain costs are inherent in these education strategies, but the magnitude of costs largely depends on level of motivation, extent of independent research, and specific education needs among employees. Improving our understanding of the problems we face with climate change and the desire for novel solutions will create flexibility and expand our capacity to innovate.

Perhaps the most critical consideration in identifying solutions to climate change is sustainability. In its simplest form, sustainability is the practice of consuming resources at a rate that does not deplete them faster than they can be produced, ensuring that an equal or greater amount of those resources are available to future generations. To achieve this, the triple bottom line – environmental friendliness, economic soundness, and social equitability – must be considered through a lens of sustainability. [The United Nations' 17 Sustainable Development Goals](#) (SDGs) are a blueprint for businesses and governments, detailing grand problems of sustainability across the globe and setting quantifiable targets and indicators to work towards. SDG #13 is to "take urgent action to combat climate change and its impacts". The indicators for this goal include reducing total greenhouse gas emissions, reducing deaths caused by natural disasters, and mobilizing \$100 billion annually from UN member states through 2025. Through government policy, the most impactful changes will be achieved.

Energy-related sustainable solutions generally focus on reducing atmospheric carbon dioxide levels and fossil fuel demand. Cleaner and renewable energy sources are one solution to accomplishing this. As technology advances, energy storage solutions should increase the viability of renewable energy sources which can be affected by seasonal or diurnal factors. Decreasing the cycle for the Return on Investment (ROI) will increase the economic viability of innovative and renewable energy sources, leading to wider-spread implementation and diversification of accessible energy sources.

Further incorporation of renewable resources is helping to revolutionize some other areas of infrastructure. Carbon capture systems (CCS) and storage technology are being implemented at existing fossil fuel power plants and industrial/asphalt plants. These systems work by capturing emissions created by manufacturing processes and condensing them into usable material which can be used as an aggregate binder in construction applications, for instance. This technology is currently cost-intensive since it is in its infancy, but further adoption and advancement

may improve its cost-effectiveness and allow larger-scale implementation. Another example of innovative infrastructure usage for renewables, one which could be incorporated into Hoyle Tanner's work, is rubberized asphalt concrete (RAC). RAC is a material that consists of at least 75% crumb rubber modified (CRM) sourced from scrap tires. A California life cycle cost analysis conducted in 2012 found that RAC was more cost-effective than conventional hot mix asphalt (HMA) in all roadway construction applications.

Large-scale climate change solutions need to incorporate resiliency in addition to sustainability. Resiliency is a critical component of both society and infrastructure. Developing social mechanisms and infrastructure which can endure the unexpected through flexibility or adaptation is vital for responding to the impacts of climate change. Many of these impacts are already being felt; as a result, future effects can be predicted. National organizations have begun recognizing this and have created funding streams for projects addressing climate change resiliency. FEMA has created the BRIC (*Building Resilient Infrastructure and Communities*) program. FHWA has initiated the PROTECT (*Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation*) formula program. EPA offers funding for resilient water quality and wastewater infrastructure through the CSWRF (*Clean Water State Revolving Fund*) and the OSG (*Sewer Overflow and Stormwater Reuse Municipal Grants*) program. FAA's AIP (*Airport Improvement Program*) awards funds to qualified airports for developing comprehensive sustainability programs and is currently conducting research to identify best management practices for addressing resiliency.

The initial costs for climate change education and the development and implementation of climate change solutions have historically been considered prohibitive on a large scale. However, proactive adaptation and mitigation are the most affordable ways to combat climate change rather than dealing with costs after the damage has been done. Innovation requires a contribution of considerable time and effort. Committing to costs up front is a challenge when looking at, for example, international policy, but failing to dedicate the time and resources needed for developing and implementing climate change solutions can lead to more significant future economic impact.

1.3 Small-Scale Solutions

While climate change mitigation would be most impacted by large-scale solutions, smaller organizations can still contribute positively. As stated previously, finding innovative solutions for climate change mitigation is driven by education. Since most companies do not have dedicated time, funding, or facilities for climate change research and development, it is critical that personnel stay informed about advancements in materials, methodology, and technology from elsewhere. It is also beneficial to stay up to date on innovative practices implemented by competitors and adopt practical approaches when appropriate.

Organizations may promote sustainable practices that can make an impact on a smaller scale. Examples in the context of a company can include remote work, increased recycling in the office, composting in the office, selective rental or purchase of office space (i.e. opting for a LEED®-certified building, or an existing building vs. building a new structure), using electronic documents instead of physical ones ("*think before you print*"), and carpooling. These actions can significantly impact a company's carbon footprint over time. The leadership of companies and organizations can hold employees accountable and promote these types of sustainable practices.

Clearly detailing the economic benefits of sustainable and renewable solutions, specifically through life cycle cost analyses, should be a top priority for small companies and individuals. Even in the absence of large-scale policy change, dedicated contributions from organizations and individuals can still have a quantifiable impact on climate change.

2. Our Company

Hoyle Tanner is a small civil engineering consulting firm based in Manchester, New Hampshire with over 100 employees, including engineers, planners, technicians, and support staff. We have completed nearly 13,000 projects for a variety of municipal, state, federal, and private clients since the company was founded in 1973. Our professional staff has expertise in several disciplines, including civil, structural, water quality, ground transportation, and aviation engineering. Our five branch offices based in New Hampshire, Massachusetts, Maine, Vermont, and Florida have allowed us to complete projects throughout much of the east coast. We are committed to supporting our clients through quality engineering services, public outreach, and funding guidance. Our vision is to improve the natural and built environments, providing healthy and vibrant communities.

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Our role in the civil engineering industry places us in a unique position to influence infrastructure and development and advocate for innovative, sustainable, and resilient solutions. While we are committed to improving our own internal business practices, we strive to positively impact climate change mitigation in both our own and our clients' communities, and we intend to be a leader in this regard.

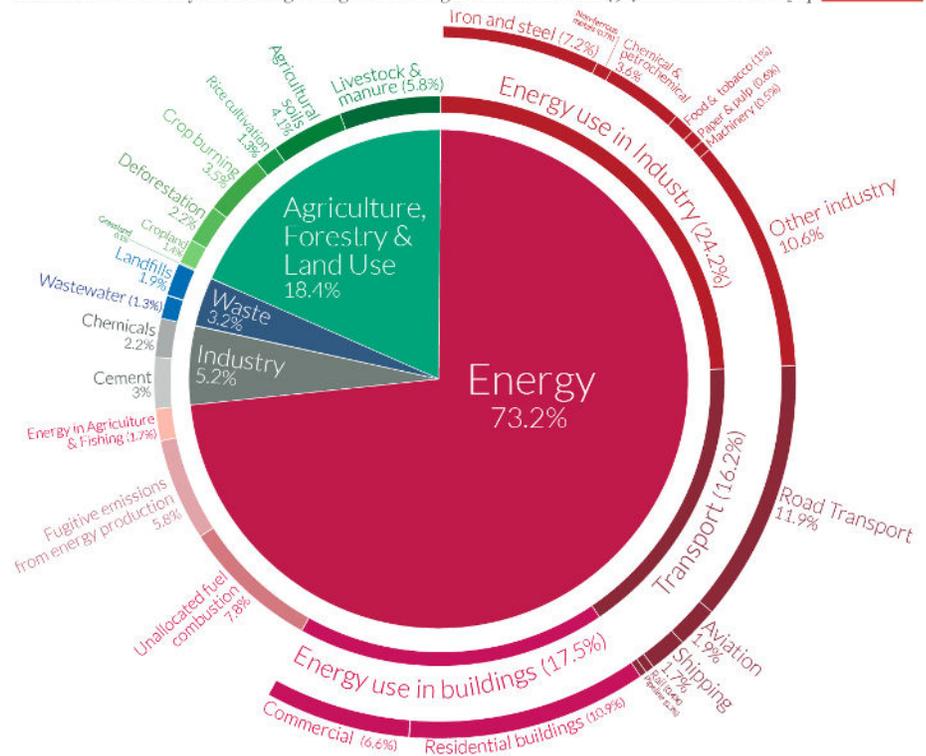
From 2019 to 2021, the average decline in our utility costs across our New England offices was approximately 14%.

3. Our Carbon Footprint

As a service provider, our direct carbon emissions are limited almost entirely to commercial energy use in buildings and as a result are [relatively low compared to many industries](#). We currently have six offices located across five states, each of which requires power and HVAC despite most being less than fully staffed on any given day due to our new hybrid working model. From 2019 to 2021, the average decline in our utility costs across our New England offices was approximately 14%. We do not receive detailed utility data in all of our offices, but this translated to a 16% reduction in energy usage in our Manchester headquarters over the same period. While this reduction in energy usage in our office spaces appears at first glance to be a good thing, the COVID-

Global greenhouse gas emissions by sector

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq.



OurWorldinData.org – Research and data to make progress against the world's largest problems. Source: Climate Watch, the World Resources Institute (2020). Licensed under CC-BY by the author Hannah Ritchie (2020).



19 pandemic pushed our staff temporarily to home offices before our hybrid working model came into effect, and a significant percentage of our employees still work from home on an almost-daily basis. Neither a 14% reduction in office utility costs nor a 16% reduction in office energy usage is enough to cancel out the sizeable increase in energy usage at employees' home offices. We currently produce some waste in our offices, using non-recycled K-cups for coffee, single-use items during social events such as paper plates and plastic utensils, and no composting system. We also print large volumes of documents, though more of our business is completed with digital documents in the wake of the COVID-19 pandemic. We also contribute to our carbon footprint through travel. These contributions include mileage for site visits, trade shows, conferences, job fairs, and airfare for out-of-state events.

While our direct contributions to climate change are relatively insignificant as a service provider, we design solutions for large developments and infrastructure around the country and have a responsibility to reduce our indirect carbon footprint on these projects as much as practicable. Many of Hoyle Tanner's business practices are driven by familiarity and cost. Due to scheduling, budget, and in many cases, constraints related to national standards for safe design practices, we rarely set aside time or funding to research new and innovative ways to complete tasks that have a known and sometimes internally standardized method of completion.

Additionally, communities we work in often prioritize initial costs (as opposed to maintenance or environmental impact costs) to fix a current problem. This often leads to a minimal exploration of options that consider future resiliency and life cycle costs for infrastructure. While personal research is encouraged and publishing research is incentivized, most employees of Hoyle Tanner do not self-educate on emerging innovations to reduce the carbon footprint of our company and projects. Our services could be improved to generate resiliency assessments for our work and advocate for innovative, sustainable, and resilient solutions for our clients.

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In summary, we still maintain some traditional business practices which are not sustainable, but they have been significantly reduced since the COVID-19 pandemic. Where we have more legitimate room for improvement is how we advocate or sometimes fail to advocate for innovative, sustainable, and resilient solutions on projects.

4. Our Adaptations

While Hoyle Tanner is still in the initial stages of defining and committing to its climate change mitigation efforts, we have already made changes, specifically in response to the COVID-19 pandemic, which contribute to those efforts.

4.1 Internal – Company Business Practices

In recent years Hoyle Tanner has made changes to existing internal business practices in response to the COVID-19 pandemic, many of which have had the added benefit of reducing our own carbon footprint. Many communication and business methods were disrupted and needed to be transitioned to an online setting. We were forced to innovate in our communication methods, identify remote data acquisition methods to replace in-person data gathering, and transform presentations or documents for shared access, allowing concurrent progress. These changes and more allowed us to become better suited for a virtual work environment both during 2020 and in the years beyond.

Despite being forced to adapt to the pandemic, Hoyle Tanner already had policies and virtual infrastructure in place which helped smooth the transition to remote work. The majority of employees had laptops instead of desktops prior to the pandemic and many of our review systems had already been shifted to an electronic setting. Additionally, we were already doing some basic collaboration between offices which helped employees adjust to full-time remote communication. Our company has also provided resources to employees to equip their home workspaces to suit their needs.

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Hoyle Tanner developed a Corporate Telework Policy to allow employees to work remotely even after a return to the office was feasible. We follow a hybrid system that allows employees to define their remote work arrangement with approval from a supervisor. As we have seen during the pandemic, this structure provides resiliency for potential future emergencies. Certain trainings and conferences previously done on-site in offices, job sites, or out-of-state are also now offered online. These practices have significantly decreased the need for travel between client sites, offices, and homes, reducing our emissions.

As an added benefit, these remote work capabilities have improved our ability to offer quality services to clients by seamlessly connecting employees in various locations. The virtual infrastructure and remote work experience greatly improve our flexibility, allowing staff to access resources in different offices while also assisting us in distributing workload across personnel. A second advantage is that it provides us with increased flexibility during the hiring process, as new hires can often select which office they want to work in even if the discipline they wish to work for is based in a different office.

The use of paper and printed documents has also been dramatically reduced over the last decade. This has been achieved through a transition to electronic documents for invoices, bidding, and contracts between our clients, subconsultants, and contractors. This transition saves not only physical paper but also time, money, and fuel by avoiding physical exchange of documents. As a company, these evolutions have helped us prove that we can adapt to new and sometimes untested technologies and solutions while still maintaining a strong focus on our work and clients.

Outside of transitioning to the online work world, Hoyle Tanner has had some push for climate change-specific innovation. A new incentive program, or honorarium, has been established for employees who wish to self-educate and inform others through writing, publishing, and presenting technical journal articles. In addition, we have initiated a work group focused on mitigating our company's climate change contributions. We refer to the group as RISER, which stands for *Resilience, Innovation, Sustainability, Economics, and Renewables*. The RISER Group's first major goal has been generating this document, our own Climate Action Plan, which is one of our main methods for promoting innovation in internal business practices and climate change solutions.

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Another sustainable and renewable practice Hoyle Tanner has adopted is participation in the [Dell Recycling Program](#) for our leased computers. This service provides end-to-end equipment recycling by reusing the components that are in good health and recycling the outdated ones to be turned back into usable materials. Additional office equipment

and materials are regularly donated to local schools or non-profit organizations when no longer needed and in good condition, rather than being thrown away.

4.2 External – Client Services

Hoyle Tanner has taken some initial steps to ensure the consideration of innovative solutions on projects. External innovation at Hoyle Tanner comes from client interaction. Recommending and advocating for sustainable design and certification is a practice that is a recent innovation. A specific example is that our company has started to consider innovative solutions for our projects to be directly compared with conventional solutions. These comparisons are presented to clients in alternatives analyses with costs and benefits laid out, along with any other relevant information. Ultimately, any final decision is up to our client, but our intent is to educate them on every aspect of our recommendation so they can make an informed decision. By incorporating these types of options into design alternatives, our clients have the freedom to incorporate sustainability into their projects to the extent that they desire and are financially able.

We have also started to pursue projects which incorporate several types of renewable energy.

We have also started to pursue projects which incorporate several types of renewable energy. Hoyle Tanner's team of engineers has previously worked on hydroelectric feasibility studies and rehabilitation of aging hydroelectric dams, as well as the design and permitting of 15 solar power project sites in Maine, generating a total of over 100 Megawatts (MW). We are additionally in the conceptual planning process for solar projects to generate another 100+ MW of power in the US Virgin Islands which, if constructed, could provide power to the entire island of St. Croix.



Another example of our commitment to recommending more innovative solutions is that we have developed and implemented infrastructure asset management programs for our client communities in recent years. Infrastructure asset management is a method of managing infrastructure assets more efficiently to allow for the maximum level of service. It consists of making an inventory of infrastructure assets owned by a community (for example roads, sewer pipes, structures), documenting their age and condition, and identifying regular maintenance, repair, and replacement protocols. Rather than completing maintenance, repair, and replacement in response to system failures, infrastructure asset management promotes a proactive approach. This keeps both financial and environmental life cycle costs down to maximize ROI, assists communities with budgeting, and ensures a higher level of infrastructure service with fewer failures. Infrastructure asset management is a direct example of the resiliency

and flexibility we at Hoyle Tanner want to build into all levels of infrastructure to best prepare for the inevitable impacts of future climate change.

5. Climate Action Initiatives

In addition to the changes we have already implemented to improve both our own business practices and the services we provide our clients, we have identified three Climate Action Initiatives (CAIs) meant to mitigate our own climate impacts which we intend to pursue as the company moves forward.

5.1 Initiative 1: Reducing Our Internal Impacts

While our carbon emissions are already low as a service provider compared to many other industries, we still have room for improvement regarding reducing our own internal carbon footprint. Our office spaces and business practices have evolved in response to the COVID-19 pandemic, but we have the capacity to adopt additional sustainable practices.

5.1.1 Potential Improvements

There are a handful of ways to improve our company's internal operations by adopting innovative and sustainable policies that focus on our own resiliency. It is our intention to commit to cleaning up our remaining unsustainable practices in our office spaces. While we have made substantial progress toward reducing our consumption of non-renewable resources in the wake of the COVID-19 pandemic, we must be cognizant of maintaining this mindset and continuing to reduce our resource consumption. We could additionally reduce our impacts by promoting the repair and reuse of older hardware, equipment, and furniture. While we make efforts to "pass down" many of these types of materials internally from employee to employee, we could further reduce the number of new things we acquire by focusing on repairing or repurposing what we already have.

We hope employees can carry this mindset to the home office and the home itself. A long-term environmental impact will be realized when this becomes a habit for our staff.

Promoting and encouraging the recycling of aluminum, plastic, glass, and paper also needs to become a bigger part of the corporate culture. Employees must be better educated on these topics to ensure they understand that even minor changes can make measurable impacts on sustainability. This can be accomplished with informative posters near trash/recycling containers, email distribution, Lunch and Learn training sessions, and other social education events to be facilitated by the company. We must ensure employees understand the criticality of sustainability so we can fully subscribe to the mindset that sustainable actions are worth a small amount of time and effort. We hope employees can carry this mindset to the home office and the home itself. A long-term environmental impact will be realized when this becomes a habit for our staff.

One sustainable practice that we as a company have yet to embrace is composting. All six of our offices generate used coffee grounds and other food waste and composting would be an effective method of reducing our impact on landfills. Composting materials can provide additional benefit to employees for home gardens or could perhaps be donated to local entities for use in outdoor gardens. Other small efforts could include adding more plants in the various office locations to promote cleaner air and an overall "greener" feel.



Another inefficiency is our excessive energy usage in office spaces, which are less than fully staffed on any given day due to our hybrid working model. While we have seen a slight reduction in energy usage since before the pandemic, it is not enough to cancel out the increased energy usage in employees' home offices. This could be combatted in several ways, including installing high-efficiency light bulbs, installing motion sensors or timers on lights to minimize their use, and selecting LEED®-certified buildings for company office spaces. An added benefit is that the overhead saved by the company on energy costs can then be reinvested into developing additional sustainable practices and initiatives. The company would likely benefit from building a sustainability committee that can focus on minimizing our carbon footprint with our in-office business practices. Many of these types of small steps can make an impactful difference when done on a regular basis.

We have additional capacity for improvement in our mindset rather than just how we handle our day-to-day operations. Continual support for self-education and knowledge sharing will be vital in retaining an environment of innovation within the company. Our honorarium program and the Lunch and Learn series can help to facilitate a time and place for group sharing. This way, employees not involved in the process of self-education can still learn about innovations in sustainability and resiliency through coworkers. We as a company can continue to modernize through flexibility in innovative technologies and societal practices. We successfully navigated the communication and efficiency challenges of the COVID-19 pandemic and hope to maintain such resiliency in the future.

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5.1.2 Anticipated Costs to Hoyle Tanner

Sustainable changes to the company will come at low or no cost overall and will likely yield additional benefits. For example, the reduced office usage has resulted in an average utility cost reduction of 14% across our New England offices from 2019 to 2021. The company can take advantage of these reduced costs by reinvesting the savings in other sustainable solutions or company-wide programs to reduce our carbon footprint.

The main cost of sustainable programs within the company will be personnel cost, as committees and individuals will need to spend extra time to implement climate-friendly practices and develop new and innovative ways to be a

more sustainable organization. An internal information campaign to promote recycling or carpooling, for example, has no measurable financial benefit to the company but will take very little time and effort to carry out and will positively impact the company's carbon footprint. A sustainability committee that can focus on these types of internal improvements could significantly influence the company adopting and adhering to sustainable practices.

5.2 Initiative 2: Advancing Service Capabilities

In an effort to better meet the challenges of improving private and public infrastructure from its current state to more resilient and sustainable alternatives, Hoyle Tanner is expounding on our scope of services in order to address our clients concerns regarding serious climate change driven issues. With sea level rise, saltwater intrusion, and more powerful storm events all forecasted over the coming decades we are committed to providing solutions to a changing environment by investing in our team so they can create the best-fit projects for our clients' needs.

5.2.1 Continuing Education

A critical component of affecting positive change within our industry and in our local communities is understanding exactly what we at Hoyle Tanner need to improve upon and how we can go about making those improvements. The best method for staying well-versed in eco-friendly construction practices is by continuing education for our engineers and corporate staff as new design standards and training become available. This goal can be tied to our own internal business practices or our work related to development and infrastructure. This desire to advance our service capabilities represents our company's commitment to staying up to date on climate change research and policy so Hoyle Tanner can become a leading expert in the field. Further development of our service capabilities takes the form of creating climate change resiliency assessments for our projects, and these may require high-level modeling of climate, tides, hydrology, and costs, among other needs. New findings related to climate change are incorporated into scientific papers, such as the UN's Intergovernmental Panel on Climate Change (IPCC) reports, which then inform changes to guidance at the federal, state, and local levels. This updated guidance may also come with renewed funding alternatives for development and infrastructure projects, specifically funding opportunities that focus on the implementation of innovative, sustainable, and renewable solutions. These changes to guidance are intended to improve the resiliency of infrastructure and new development. Much of the regulatory information is likely to be supported by reference materials that our engineers can review, but it's critical that we pursue outside training and help as needed to ensure that our team understands the necessary concepts and acquires the technical capability for applying the concepts to our work. In cases where an agency dictates a particular design standard or material specification in a way that prevents alternative solutions, we can work with them and the industry to question the standard. In some cases, industry and state, federal, and local agencies will welcome the challenge and utilize our feedback to help effect change. This pursuit of new knowledge and a desire to drive better development and infrastructure is paramount for Hoyle Tanner to mitigate our impacts on climate change, as well as to become and remain a leader in the field.

We plan on continuing additional initiatives to improve our sustainability practices, including training within our firm to educate employees who are not familiar with these methods. These internal presentations are typically offered to the whole firm but occasionally take the form of one-on-one meetings between colleagues. We plan to invest in training our employees to be knowledgeable about sustainable business practices so they can inform our clients about the costs, risks, and benefits involved. Recommendations for sustainable suppliers will be provided to our employees and clients so they can make the best decisions for their projects. Quarterly reminders/newsletters can

be sent out to the company about volunteer opportunities, practices for sustainable development and infrastructure, and new workplace sustainability advancements.

Here at Hoyle Tanner, we can improve our utilization of renewable materials and how they are implemented in our projects by sourcing grant and loan funds for clients from all levels of government. Some funding examples would be the Massachusetts Green Communities Grant and [Municipal Vulnerability Preparedness](#) (MVP) programs since these are both examples of state-specific funding. Some sources of federal funding programs are outlined in H.R. 5376, or the Inflation Reduction Act of 2022. These components include Clean Electricity and Reducing Carbon Emissions, listed under Energy Security (Sec. 13101-13105), and the Rural Development and Agricultural Credit (Sec. 22001-22007).

While research is not within our scope of services as a company, incorporating innovative business practices is. Hoyle Tanner can innovate in project selection and design by setting emissions goals and encouraging use of green technologies and energy sources with clients. Projects that do not align with Hoyle Tanner's goals can be questioned and discussed with our clients, and we can share our vision to promote candid discussions involving alternatives and other ways to accomplish a goal.

Without the capacity to design new technologies ourselves, Hoyle Tanner must strive to learn about innovations from elsewhere and incorporate them into our work. Attending conferences and workshops specific to our field, spending time on literature reviews, and providing presentations to employees on innovative practices will improve our company's ability to do this and will help establish Hoyle Tanner as a regional leader in climate-conscious engineering.

5.2.2 Anticipated Costs to Hoyle Tanner

The costs associated with the investment in our employees' continuing education is a practice that has been in place at Hoyle Tanner since our founding in 1973. Additionally, employees across multiple branch locations have obtained LEED® and Envision certifications, which we will continue to endorse. Our team is also well-versed in the submission of grant applications for federal and state programs that fund resilient and sustainable projects such as FEMA's *Building Resilient Infrastructure and Communities* (BRIC) grant program and the Federal Highway Administration's *Promoting Resilient Operations for Transformative, Efficient, Cost-Saving Transportation* (PROTECT) program.

5.3 Initiative 3: Advocacy for Innovative Solutions

At Hoyle Tanner we are set on implementing a company culture that leads our clients toward project designs that are both cost-effective and resilient in the face of climate uncertainty. By developing strong community and client relationships we are able to illustrate the benefits of sustainable and renewable choices over traditional methods. Our company volunteer efforts align with this commitment as we advocate to protect waterways, recreational areas, and wild spaces within our communities.

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5.3.1 Advocacy

Advocating for sustainable practice and design will be one of the larger parts of our company's innovation plan. With the existence of many different resilient and sustainable certifications pertaining to building, land, and infrastructure development, there are many opportunities to advocate incorporating sustainability to clients' projects. Employees are encouraged to obtain certifications like LEED® and Envision SP® in order to be up to date on current innovations. Our team members can also suggest alterations to client operations that will ultimately result in more sustainable choices. An example of this is a 2021 pilot program in Colchester, Vermont where the community is testing out flexible power load management among some of their largest commercial and industrial customers. This practice refers to reducing energy demand during peak hours when power is typically the dirtiest and instead consuming it when grid demand is low. Showing that our company is developing our knowledge on a sustainable topic like this can help assure clients that adding sustainable practices to their project is the right decision.

While it is our job to learn how to innovate our practices to become more competitive in the sustainability market, it is also our job to be there to educate our clients and answer any questions or concerns they might have.

Another action that can help to facilitate client involvement in sustainable practices is to educate employees on how to work with clients on topics like this. Sending employees to workshops or partnering with other consultants and organizations that focus on sustainable consulting may be a cost-effective method to ensure that clients are getting all the information needed to make sustainable decisions. While it is our responsibility to learn how to innovate our practices to become more competitive in the sustainability market, it is also our responsibility to educate our clients and answer any questions or concerns they might have.

This dedication to sustainability advocacy helps us to embrace our Corporate Vision of creating projects that improve the natural and built environments that, in turn, provide healthy and vibrant communities.

We often think about human-induced climate change as something that will happen in the future, but it is an ongoing cumulative process. Ecosystems and communities in the United States and around the world are being impacted today. [According to NOAA](#), "Global temperatures rose about 1.98°F from 1901 to 2020; but climate change refers to more than an increase in temperature. It also includes sea level rise, changes in weather patterns like drought and flooding, and much more". Things that we depend upon and value — water, energy, transportation, wildlife, agriculture, ecosystems, and human health — are already experiencing the effects of a changing climate. The steps we take today will help ensure our infrastructure's sustainability and a healthy environment.

Hoyle Tanner can make efforts to widen our scope of services to include climate resiliency assessments specific to our clients' project types. We can start pursuing this initiative by investing in training for our engineers to become informed about resilient alternatives to implement in our work. From here we can establish a discussion model to facilitate informed decision-making with our clients and communities. This helps us to advocate for resilient options while considering return on investment, community concerns and goals, long-term planning, etc. We can also look back on prior projects to identify areas for improvement and use these as examples for future considerations in resiliency planning.

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In order for clients to "buy in" to renewable alternatives for their projects, if they were not already pursuing them, our engineers will have to demonstrate the benefits and prove the value of renewable options. With the knowledge that renewable alternatives can often require a higher upfront cost, performing a life cycle cost analysis is essential to show clients that their initial investment will save resources in the long run. By leveraging the societal advantages that come from renewable solutions and showcasing both communities who pursued similar solutions and our other clients' successful projects, we will hopefully have proven their benefits. If that is not enough, we can also encourage our municipal and state clients to move toward renewable alternatives based on the public's support for those solutions.

5.3.2 Anticipated Costs to Clients

By promoting and utilizing asset management techniques, our team can provide accurate assessments of the most feasible renewable products on the market. Our team employs GPS, [LiDAR](#), and drones/sUAS that help illustrate the unique conditions present at any site, making it easy to find practical solutions for our clients. Pairing these techniques with a new "lifecycle cost assessment" would allow for consideration of sustainable and other nonconventional alternatives, and internal budgets will allow clients to explore these new solutions fully. These tools and methods all help to support thought-provoking discussions with our clients on why they should consider using federal and state grants focused on resiliency and sustainability to achieve their project goals, even if it means modifying them to fit within the parameters of the funding source.

6. Implementation and Monitoring Strategies

Innovation in resiliency planning is advancing and the ways in which we implement it need to be adaptable to our evolving needs. Expanding our design and construction services to include innovative and resilient practices starts with an investment in training and research for interested team members who can become internal experts, able to share and document their knowledge within the company. This document serves as a first step in this process. Monitoring strategies can also be set in place to assess previous projects and how they have handled unforeseen events. By determining reassessment intervals internally or as a recommendation to be rolled out to clients, we can identify areas where innovative resiliency planning should be prioritized on future projects and document these findings to advocate for subsequent designs.

Hoyle Tanner plans to evaluate our overall business practices on an annual basis to ensure we are meeting and evolving our sustainability goals. A few examples of this can include monitoring of travel, electricity, paper usage, and general waste.

Hoyle Tanner can send out surveys to employees and/or clients to gauge our company's sustainability and receive valuable feedback. Supervisors will be encouraged to meet with their employees frequently to ensure sustainable solutions are being advocated both for our office locations and our clients.

Hoyle Tanner plans to evaluate our overall business practices on an annual basis to ensure we are following our sustainability goals.

Hoyle Tanner can achieve our desired progress in adopting these components of our Climate Action Initiatives by educating clients, gathering public support, and partnering with industry leaders. By presenting renewable alternatives early on in a project's design, we alert our clients to our commitment to our CAIs. Additionally, having a metric of public support when bringing up these suggestions will strengthen our argument to the client in favor of

renewables. By partnering with renewable industry leaders, we can collaborate in delivering the most ecologically beneficial product to our clients that also meet their design standards.

We can evaluate the goals set forth in these CAIs by comparing the frequency of renewable design projects from previous years to those produced in the coming years as we endeavor to increase our implementation of renewable materials.

The cost savings of implementing our Climate Action Initiative and changing our company culture are easily measured through mileage and power usage metrics. By utilizing hybrid construction meetings, project managers will be able to significantly cut down on their work-associated mileage while resident engineers are available on-site to meet with contractors and clients face-to-face. For conference-related travel our staff is encouraged to try and attend local events where car travel is more feasible than air travel. Lastly, we can assess the impact of these changes as they are reflected in our energy utilization across all our offices since the implementation of our Corporate Telework Policy lessens the collective energy demand.

7. Conclusions

Hoyle Tanner is fully committed to embracing internal and external business practices that focus on resilience, innovation, sustainability, economics, and renewables. The IPCC states that global climate change is rapidly accelerating at a rate faster than previously estimated. Given the unlikelihood of large-scale evolutions, much of the responsibility for climate change mitigation falls on the shoulders of smaller organizations and individuals. Hoyle Tanner will endeavor to be an industry leader in this regard by adopting the three Climate Action Initiatives highlighted in this Climate Action Plan. These initiatives are intended to facilitate the improvement of our own business practices, promote the progression of our staff's technical capabilities, and ensure advocacy for innovative solutions in our industry. Through adoption of these initiatives, we plan to do our part in reducing human contributions to climate change.

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